GAYLE SOUTER-BROWN

Landscape and Urban Design for Health and Well-Being

USING HEALING, SENSORY AND THERAPEUTIC GARDENS

ROUTLEDGE

Landscape and Urban Design for Health and Well-Being

In this book Gayle Souter-Brown explores the social, economic and environmental benefits of developing green space for health and well-being. She examines the evidence behind the positive effects of designed landscapes, and explains effective methods and approaches which can be put into practice by those seeking to reduce costs and add value through outdoor spaces.

Using principles from sensory, therapeutic and healing gardens, Souter-Brown focuses on landscape's ability to affect health, education and economic outcomes. Already valued within healthcare environments, these design guidelines for public and private spaces extend the benefits throughout our towns and cities.

Covering design from school grounds to public parks, from public housing to gardens for stressed executives, this richly illustrated text builds the case to justify inclusion of a designed outdoor area in project budgets. With case studies from the USA, the UK, Africa, Asia, Australasia and Europe, it is an international, inspirational and valuable tool for those interested in landscapes that provide real benefits to their users.

Gayle Souter-Brown is founder and director of Greenstone Design UK Ltd, salutogenic landscape and urban design consultants. Her research interests in design for health and well-being follow years working with disabled adults and children. With twenty-five years of international experience she lectures, writes and designs from the UK and New Zealand.

Presenting green space as a human lifeline, this is an excellent and accessible read for the practitioner and students alike. Concepts of architecture, design, sustainability and well-being are blended with whole of life costing approaches to make the case for a supportive urban environment in which individuals, families, communities and business can thrive.

– *Teena Hale Pennington, CEO New Zealand Institute of Architects (NZIA)*

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Using healing, sensory and therapeutic gardens

Gayle Souter-Brown

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To the children of Kimi Ora School and to Jane and Airini who, 45 years ago, first opened my eyes to the concept and reality of disability, the challenges and opportunities of living outside the statistical norm. And to my grandparents, who showed me how to garden with grace and humour.

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Foreword

What makes people healthy? Kaplan and Kaplan's attention restoration theory (ART), as explained in their book *The Experience of Nature: A Psychological Perspective*, describes how people concentrate better after spending time in natural environments, because watching a beautiful sunset or the nesting of birds in a tree does not demand the same level of attention that filtering a multitude of competing stimuli on a busy city street does. With recent rapid urbanisation, millions of people spend most days in, on and around city streets. Our functional ability to concentrate is just one measure of our health, but it has important implications socially and economically. If it is possible for design environments to facilitate and improve concentration, is it possible to improve other sensory and cognitive functions?

The design of healing healthcare environments has recently received increasing attention, as our knowledge of the links between the mind and the body are more widely understood. Landscape and urban design for health and well-being is of critical importance not only because healthcare systems around the world are under pressure, but also because of the broad social, economic and environmental factors at play. If the link between environment and health is evident, there is a direct implication on the focus of urban planning, health and education interventions where the population is unhealthy, dysfunctional and unproductive. How and where we live, work, play and go to school determines in large part our longevity, productivity and quality of life. Can design specifically for health and well-being be used to stimulate positive social change in and around our cities? The answer is yes, and the author of this comprehensive text explains how.

Globally a significant proportion of people live in cities today, and inevitably, urban living affects population health. Health is critical to our ability to function within society. Increasing rates of urbanisation coupled with financial and environmental challenges requires us to look for innovative solutions. It is therefore important to understand how we can adapt to this era of chronic "lifestyle" diseases. Using principles from sensory, therapeutic and healing gardens, the author focuses on landscape's ability to affect health, education and economic outcomes. Already valued within healthcare environments, these design guidelines for public and private spaces extend the benefits throughout our towns and cities. To start off, there are various perspectives on what constitutes health and its relation with landscape and green space. In society, as in building codes, disability as a physical condition is frequently afforded more attention than mental illness. The 1999 World Health

Organization definition of mental health as 'a state of well-being in which the individual realises his or her own abilities, copes with the normal stresses of life, works productively and fruitfully and makes a contribution to his or her community' does not mention illness. This positive state relies in large part on our response to the urban environment.

Research within the emerging fields of environmental and geographical psychology adds weight to the body of evidence from medical science. Internationally respected authorities such as the World Health Organization, universities and US and British medical associations suggest that a well-designed built environment with green space can positively shape the social, psychological, and behavioural patterns of society, leading to improved health and well-being.

The growing prevalence of non-communicable diseases (NCDs), or "lifestyle" diseases, is highly related to the quality of infrastructure and the design of the built environment. Suggestions about how we can reduce NCDs such as obesity are one of the primary challenges facing the designer and planner. Ageing populations and urban growth are two further huge challenges to which design can apply itself. This book shows why and how we must focus on the innovative design and planning of green, sustainable and healthy urban planning around the world. The author challenges the reader to confirm it is the task of the designer and planner to reconsider the value of landscape and health with a knowledge-driven approach to salutogenic design.

Landscape and urban design for health and well-being uses knowledge of the efficacy of healing, sensory and therapeutic garden design to reduce stress, treat depression and facilitate an active, healthy lifestyle. Urban farming, community gardens and edible sensory gardens combine to facilitate urban lifestyles that treat obesity and reduce the risk of coronary artery disease, stroke, dementias and depression.

The quality of the built environment can promote health and well-being by exposing our brain to the right balance of stimuli in a way that creates positive emotions and experiences. The author provides clear guidelines as to how to design to facilitate such responses. The design quality of the built environment is shown to be critical to our ability to manage stress. Cities with high-quality green infrastructure reflect the image and vision of governments to create a healthy society.

The aesthetic value of our surroundings communicates the values of our society; beautiful places are not only stimulating, but they have also been proven to be sources of enjoyment that make us feel less anxious and stressed. They also attract investment. A well-designed built environment can positively shape the social, psychological and behavioural patterns of our society. If we embrace nature within the built environment, for example, or fill our workplaces with greenery and access to plants, flowers and sunlight, it is possible to optimise brain performance and restore our energies.

The approach of salutogenic architecture promotes a healthy lifestyle by creating a built environment that focuses on wellness factors that promote health, thereby contributing to the realisation of a healthy society though well-integrated nature and green space.

The world needs a new paradigm and the creation of a healthy global society is a vision we should all embrace by establishing closer connections to nature and

through living with nature. This book shows how, and provides cost–benefit analyses to demonstrate the economic case for enhanced green space. Exchanging knowledge to influence government policy, change commercial incentives and encourage positive changes in people's lifestyles through the design of the built environment is the path to a new future. Through an interdisciplinary approach, architects, landscape planners, designers, engineers, public health scientists, psychologists and economists could do more to alleviate the human condition by creating stimulating, enjoyable and sustainable environments that enhance the quality of health and well-being for all.

As more scientific research demonstrates the links between emotional well-being and good physical health, so it becomes even more apparent that our physical environment when endowed with high-quality green space has tremendous potential to promote positive emotions. With positive emotions comes a reduction in "lifestyle diseases" and hence improved physical health.

Gardens with therapeutic qualities have been used for decades in healthcare design. However, we need good-quality gardens and green space to restore and rehabilitate our mind everywhere that people live, work and play. Gardens and green spaces are an integral part of a salutogenic approach to the design of the built environment and infrastructure. While significant progress has been made in understanding the value of green space and access to nature, there are still inadequacies when it comes to implementation and understanding the therapeutic impact that gardens have on our life. One of the most pressing subjects is the rehabilitation of our existing cites and built environments into eco-cities that can integrate green spaces and gardens to support the creation of a healthier society.

The author explains in this very extensive book many aspects of landscape and urban design in relation to health and well-being, while she argues that landscape design for health and well-being is a new concept for many people. Designers may need to be able to educate the client and actively work with them to develop the design brief. Research-based design requires examination of what people have done before, the purpose and the outcome.

The International Academy for Design and Health acknowledges and applauds the excellent work of Gayle Souter-Brown in the development of this book and considers it to be one of the most valuable contributions to the dissemination of knowledge on nature and health. Architects, developers, medical practitioners and educators will find value in how access to nature could improve our health and well-being. I strongly recommend this very enjoyable book to anyone who would like to find out about this important topic.

Stockholm, June 2014
Professor Alan Dilani, PhD
International Academy for Design and Health

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Introduction

Landscape and urban design for health and well-being – using healing, sensory and therapeutic gardens

Internationally, populations are ageing, more people are living with disability and there is less money to support them. At the same time environments are being degraded. Fortunately there is a recently rediscovered body of evidence that supports the view that nature generally, and everyday living environments in particular, can have a profound effect on health and well-being. Connecting with nature can restore cognitive attention (Kaplan and Kaplan, 1995, 2002), improve blood pressure and self-esteem (Pretty et al., 2005), support pro-environmental behaviours (Hartig et al., 2001) decrease symptoms of attention deficit disorder (Kuo and Taylor, 2004) and improve community resilience (Moore et al., 2006). Contact with nature is an effective 'upstream health promotion' tool for whole populations. That is, it is useful in prevention of mental health conditions (Maller et al., 2006). Studies have shown that exposure to natural environments enhances our ability to recover from stress, illness and injury, and provides a wide range of social, psychological and physiological benefits (Ulrich, 1984; Kofler, 2010). Across our towns and cities, a connection with nature has been found to be a vital, albeit often unconscious, part of being human. Healing, sensory and therapeutic gardens offer an urban setting to connect.

This text is intentionally accessible. Designed for students and practitioners of design, health and education, it is not a dry academic discourse but rather reflects evidence-based international design experience. It is about using green space to develop livable cities that address the triple bottom line. As an environmental advocate I make no apology for offering solutions that help the planet as they help the people. As a student of economics I understand the need for everything that we provide today within the public realm to be cost-effective and cost-efficient.

Landscape and Urban Design For Health and Well-Being is written to meet the needs of people interested in making a difference socially, economically and environmentally. For the past 100 years or so, architecture has taken the lead role across urban planning and the built environment. The landscape or green component of a development scheme has been seen as an add-on, an additional 'nice-to-have', frequently costed out when there is insufficient money left over at the end of the project. The following chapters show that we need well-designed green space costed in at the project's inception if we are to achieve livable, healthy cities.

E. O. Wilson describes in his seminal book *Biophilia* (1984) our innate love of living things. He coined the term biophilia to describe the connections that human beings subconsciously seek. Trees, small plants, large animals, insects and the weather are all

part of that nature connection. I believe it is the fact that we are hardwired to respond that determines the measureable neurological and physiological effects of natural environments. If we lose our connections or do not forge early links with the natural world it is like losing a good friend. We become stressed and depressed and look for ways to replace our loss, often without being aware of our deficit or our actions (Pretty et al., 2005).

The World Health Organization's (WHO) 2010 Global Burden of Disease (GBD) study (Ferrari et al., 2013) reported that depression is now the second largest cause of disability worldwide and a major contributor to suicide and ischemic heart disease. Disease and disability is considered a 'burden' because of the profound social and financial impact on the individual, their community, and the wider economy. The WHO's findings 'reinforce the importance of treating depressive disorders as a public-health priority and of implementing cost-effective interventions to reduce their ubiquitous burden' (Ferrari et al., 2013). The findings, when considered in conjunction with previous research outcomes, are fundamental in establishing the need for green space across our urban centres. The WHO is the international body tasked with monitoring the human health situation globally and assessing health trends. Within the organisation there is growing recognition that the ecological health of our planet is deteriorating. We have cleared forests for farming and built over parks and playgrounds. The United Nations, government leaders, practitioners and academics have spoken of the need to enhance and protect our environment. Now that major international organisations have noted linkages between health and environment, it is time to act.

While almost any green space can provide an association with natural elements, gardens created using evidence-based principles are recognised as being most effective. When guided by a knowledgeable designer and appropriately implemented, gardens can promote stress reduction and enhance health outcomes. This book explores the history of gardens to explain why environmental design is perhaps the most cost-effective tool in the fight against stress and depression. Testimony is provided citing international case studies to highlight user groups most likely to benefit from nature-based interventions. Guidelines are provided for how to design gardens to meet our biophilic need. We conclude with funding options for using landscape and urban design to address the world's second largest cause of disability. As an evidence-based tool for designers from a broad range of disciplines, the book will also be of interest to those interested in self-help, to parents of disabled children, and to stressed execs who need to know why and how to develop green space at home. *Landscape and Urban Design for Health and Well-Being* brings together current knowledge on the topic to provide such a resource.

The text is as much about health promotion as it is about treatment. It is about cost-effective landscape and urban design interventions, broken down to the scale of gardens. When we look at the built environment's relationship with nature, at the complex issues around human health and well-being, we see the need for a new way to look at gardens. Although many schemes we work on are large, master planning exercises, all are made up of gardens. This is an important point to remember. Our postgraduate intern from Guangzhou, China, told me of vast landscape development schemes she had worked on. She wanted to work with us to under-

stand how to take those vast spaces and make them feel personal, somewhere you could feel 'at home' amongst 400 million others. She needed to create gardens, each with an individual feel and character. A garden is hence how we describe a landscape that has been formed to frame our urban existence.

When we think in terms of creating 'gardens' we are less inclined to over-emphasise hard landscapes and we re-emphasise the soft. Hard landscapes are experienced as fast moving, assertive spaces. To vulnerable people they can feel aggressive. How we *feel* in a space is critical to our sense of well-being. Soft landscapes are slower and provide the opportunity to reconnect, to literally stop and smell the roses. Socially and environmentally soft landscape interventions provide a win/win situation. Soft landscapes can restore biodiversity, rebuild wildlife corridors and absorb heat; leaves transpire to locally cool the air, provide natural shade, absorb sound and filter water and airborne pollutants. It is where soft and hard landscapes are out of balance that we most need healing gardens. Each space must work at a human scale. Gardens offer positive distraction from the 'white noise' of modern life, from the information overload that comes from digital media, from physical pain and mental suffering. Gardens can be designed to calm or to stimulate, depending on planting and materials.

At the 9th World Design and Health Congress I met with practitioners, academics and policy makers to discuss how best to deal with the increasing global burden of disease. Due to ageing populations, rising costs and diminishing budgets the current healthcare model is financially unsustainable. The Congress agreed that the best, most cost-effective, cost-efficient treatment is prevention. Without ecological health there can be no human health and well-being. For adults and children, regardless of culture, climate zone or socio-economic status, the most cost-effective health prevention comes through environmental design.[1]

Held in Brisbane, Australia in July 2013, the Congress featured speakers from around the world. I was fortunate to present alongside architects, engineers, financiers, developers and clinicians. We spoke about the need to adapt environments for climate change as the biggest global health challenge today (*Lancet*, 2009), for the growing burden of mental illness, and to counter lifestyle-related health conditions. People spoke passionately of the role that environment plays in health, of taking a preventative approach to healthcare. They spoke of the need for people to be able to access nature as an integral ingredient in the recipe for longevity and quality of life. They also spoke of the financial constraints brought about by increasingly technological healthcare that means governments and private healthcare providers cannot continue to fund the development of hospitals as they have done. While we will always need traditional hospital-based healthcare and treatment models for certain conditions, for non-communicable diseases (NCDs) such as obesity, depression, cardiovascular disease (stroke, heart attacks), cancers, type 2 diabetes and chronic respiratory disease it is much more cost effective to prevent than to treat them.

Dr Sally Fawker told delegates of the need for partnerships in care – novel partnerships. The hard urban form has damaged our health, affected our relationship with nature and had far-reaching impacts throughout society. Education, crime rates, and ultimately economies have been affected. We now need to soften that urban

form so that it becomes a supportive environment. Landscape professionals advising and working with healthcare professionals offer the novel partnerships that Dr Fawker seeks. The natural environment in general and the positive role gardens in particular can play, have been undervalued for too long.

Now is the time for landscape to be revalued as the integral part of our urban environment that it is.

> Gardens, as a microcosm of the natural landscape, have an innate ability to bring people together, to encourage healthy, active lifestyles. In the Northern Territories of Australia 5% of the children have gangrene. That is a shocking indictment on their living environment. Through gardens we bring the bio-physical and psycho-social universal health needs of the human species together.
>
> (Golembiewski, 2013)

Mental health has many cultural taboos and superstitions surrounding its causes and effects. A largely invisible disability, mental health disorder often goes unmentioned as it is frequently associated with feelings of shame (Norris, 2013). Without good mental and physical health it is difficult to access education, housing and employment. Everyday tasks become monumental as the disability weighs heavily upon the individual and their family. Society suffers as the individual suffers. It is important to provide cost-effective early intervention and prevention strategies, as stress and depression are strong determinants of physical health. They not only influence ischemic heart disease but also obesity, type 2 diabetes, cancers, and a host of other lifestyle-related conditions such as sexually transmitted disease, rickets, binge drinking, domestic violence and drug abuse.

In 2007 a group convened by the New York Academy of Medicine met to consider what to do about the growing burden of disease. They, like so many others, concluded that urban and landscape design has a significant role to play in public health. They agreed that spaces should be accessible, especially to vulnerable populations. Public green space should respond to needs at the neighbourhood level and create opportunities for social engagement, economic empowerment, nature access and stewardship. Spaces must be community-driven, ecologically sustainable, and answer the very human impulse to seek and create beauty in our everyday surroundings. They are a primary foundation for a resilient community (Campbell and Wiesen, 2011). Subsequent chapters explore these ideas, the broad effects on society, and our need to adapt the public realm for an ageing population from a landscape and urban design viewpoint.

Background

Around the world there is growing concern that human well-being is deteriorating. Advances in medical science have almost eliminated many communicable diseases, that is conditions caused by bacteria and viruses such as polio, tetanus and typhoid. Meanwhile, preventable non-communicable diseases, disabling conditions caused by inactive and self-abusive lifestyles, are increasing. The WHO is concerned that if

current trends continue no nation will be able to afford healthcare for its people. Already the NHS, the UK's national health provider, is struggling to keep pace. In the USA the situation is similarly dire.

A recent study found that

> the environment influences our health in many ways – through exposures to physical, chemical and biological risk factors, and through related changes in our behaviour in response to those factors. To answer the question 'how much disease could be prevented through better management of our environment' . . . scientific evidence was summarized and more than 100 experts . . . consulted for their estimates of how much environmental risk factors contribute to the disease burden . . . The evidence shows that environmental risk factors play a role in more than 80% of the diseases regularly reported by the W.H.O. Globally, nearly one quarter of all deaths and of the total disease burden can be attributed to the environment. In children, however, environmental risk factors can account for more than one-third of the disease burden.
>
> (Prüss-Üstün and Corvalán, 2006)

These findings have important policy implications, because the environmental risk factors can be largely modified by established, cost-effective interventions. The interventions promote equity by benefiting everyone in the society, while addressing the needs of those most at risk.

Landscape and Urban Design for Health and Well-Being aims to bridge the divide between public health and landscape. Health professionals, like educators, are trained to base decisions on empirical evidence. This is as it should be. However, intuition and acceptance of the importance of biophilia have their place too. Adding that to traditional knowledge we now have modern science. There is a need for further research but we have sufficient peer reviewed data to act. The data is compelling. It is gathered here to encourage those engaged in urban planning and design related disciplines to regulate for and create spaces that ease the burden of disease, spaces that not only look good and work well but help build sustainable, healthy communities, cost effectively.

To effectively take public health into account in spatial planning requires an acknowledgment of nature's restorative and healing powers. Being outdoors and actively gardening heightens feelings of tranquility, spirituality and peace (Kaplan and Kaplan, 1995; 2002). With this in mind, healing, sensory and therapeutic gardens, urban forests and soft landscape treatments are increasingly being reintroduced across towns and cities as an important support tool.

In the face of ageing, and in some places declining populations, rising incidences of stress and NCDs, we need to look carefully at historic and existing practices, and then change what we can. We need to look at the role landscape can play. The NCDs listed here are known as lifestyle-related diseases. They are preventable illnesses with a strong relationship to the environment in which the person lives, works, plays or goes to school (WHO, *Global Status Report on Noncommunicable Diseases*, 2011). So the question becomes, how do we engage communities to change lifestyles? What are the benefits that may accrue to the community if we do? Can we offer a

cost-effective alternative to traditional healthcare treatment models for certain conditions? By using healing, sensory and therapeutic gardens, by re-engaging people with nature, the evidence shows we can effect those changes, save money and ultimately lives.

> As the Global Strategy for the Prevention and Control of Noncommunicable Diseases indicates, NCDs can best be addressed by a combination of primary prevention interventions targeting whole populations, by measures that target high-risk individuals and by improved access to essential health-care interventions for people with NCDs.
>
> (WHO, 2000)

I have been fortunate to work internationally across health, education, housing, disabled children in schools and with their families at home, with disadvantaged youth, migrants, extended and blended families in social housing, with socially isolated older people, with executives wanting to de-stress their lives, with dementia residents in care homes, with indigenous communities, and with people young and old living with disability. Interestingly, we observe a common theme running through each of our client groups. Although each has need of some formal health provision, they also need something quite simple. All of them had disconnected from nature to a greater or lesser degree and all lived, worked, played or went to school in non-supportive environments. Their lifestyles became, or remained, sedentary and their health problems mounted as stress levels rose. From the outset it was obvious that to achieve best value socially, financially and ethically for the client, while respecting and enhancing the the natural environment, a collaborative approach would work best. Using integrated systems thinking, and often working across multi-disciplinary teams including care workers, occupational therapists, social workers, doctors and teachers, we approach design challenges from a joined-up thinking perspective.

Health happens not only at the doctor's office or in the hospital.

Given the accumulated research, we have an opportunity to apply that knowledge. Some would say we have a responsibility. Health as a state of being happens when where we live, work, play and go to school is healthy. The challenge now is to take the emphasis out, to encompass the public realm. Others authors have ably demonstrated the benefits of therapeutic landscapes within health settings (Cooper Marcus and Sachs, 2013), so we can now focus more widely, on the application of gardens for their ability to create livable cities and healthy, sustainable communities.

Divided into four parts, this text looks at the questions of where today's renewed interest in healing gardens has come from, why we need them, how they are relevant today and what we can expect from them. The origins of modern healing, sensory and therapeutic garden design, the issues and challenges of modern society such gardens can address – active ageing, mental and physical ill health, disability

due to sensory impairment – why we need to turn to nature and an asset-based healthcare system, are laid out across the following chapters.

Definitions and scope

There is growing recognition that a salutogenic design approach, that is design for health and well-being, offers a cost-effective means to keep indigenous, at-risk and non-indigenous populations healthy and independent throughout life (WHO, 2011). Forward-thinking social scientists and medical practitioners are looking to the past to explore the future potential of landscape. Since the turn of the twenty-first century sensory gardens have been designed to stimulate and soothe the senses of people on the autistic spectrum, as well as those living with post-traumatic stress disorders, dementia, stroke and spinal injuries. Over a similar time span, therapeutic gardens have improved the healing times of surgical patients and reduced their need for pain relief. Refugee children have been eased into their new homes through social and therapeutic horticulture programmes.

The commonly held view is that there are two main types of green space with healing properties: healing and sensory gardens, which offer passive health benefits; and therapeutic gardens, which afford and promote active healing. Traditionally, both types have been located within a private or controlled setting.

Healing gardens heal communities. They not only enhance local aesthetics and biodiversity and improve the mood of the people, but they help build sustainable communities. By boosting tourism and in-bound investment, increasing property values and livability ratings, healing gardens offer benefits to the local economy as well as the local population. They are gardens specifically designed to enhance mental and physical health as places to meditate, to sit quietly and chat with friends or to just relax and get away from it all. Using a careful combination of plantings and materials, they are calming and peaceful garden settings where young and old can escape and emotionally revitalise. Healing, soft landscape treatments provide a necessary balance to the harshness of the modern hard landscape and built environment. By spending time in a healing garden visitors are healed in a passive way, through sensing nature. However, healing gardens are not just for when you have become ill; they are vital in preventing illness through encouraging and enabling an active, healthy lifestyle, and in maintaining and improving a sense of health and well-being.

Many studies have shown the link between health and outdoor nature experiences. Dr William Bird, strategic health advisor to Natural England, emphasises those potential benefits; but perhaps more importantly, the *known harm, particularly to children, that comes from a deficiency of outdoor experience*. Health, design and education professionals around the world agree that children, and adults, need outdoor exercise in stimulating, green environments. What I believe is missing from previous studies is an emphasis on the supportive qualities of the environment.

Whether alone, with random strangers, or close friends, moving in a beautiful natural environment is good for us. People may not recognise the degree their lives are compromised by a lack of quality nature experience until it is provided. Royalty and captains of industry have, for centuries, enjoyed beautiful gardens and

woodland as part of their prescription for success. Bird says: 'Prescriptions for nature experiences may sound a far-fetched treatment for mild to moderate depression, but they are [as] efficacious and cost effective [as] anti-depressants' (Bird, 2009). We know the adrenaline rush of fitness junkies, but less strenuous exercise, simply being outside in a beautiful space, can produce powerful endorphins too. Anecdotal reports state that: 'Suddenly it is as if a cloud has lifted and I feel invigorated, re-energised, renewed . . .'

Sensory gardens is a UK-based term widely used in schools, veteran rehab centres and care homes. Sensory gardens awaken the five main senses by providing a

- visually pleasing,
- audible,
- tactile,
- scented,
- tasty experience.

Designed to be attractive to wildlife as well as people, they reconnect us with nature. Sensory gardens work in varied settings as they provide deep memory prompts for people living with dementia, soothe the stressed exec, provide a calm space in a school where experiential learning can be conducted outdoors, assist developmentally delayed children to achieve milestones, and balance the digital information overload.

Therapeutic gardens is a US-based term used principally in corrective and healthcare environments. These are the gardens where horticultural therapy, sometimes also known as social and therapeutic horticulture, takes place. They differ from sensory and healing gardens in that they provide active healing through the act of gardening. Examples of therapeutic landscapes include gardens specifically designed for

- dementia,
- mobility,
- rehabilitation,
- community cohesion.

Raised garden beds are commonly associated with therapeutic gardens, as they allow people of all ages and abilities to access the soil and plants.

Inclusive, accessible design is at the heart of healing and therapeutic landscapes. Increasingly the benefits of social and therapeutic horticulture, the gentle art of growing things under a structured programme, is being seen to be more widely applicable as a cost-effective treatment for a range of conditions. As the evidence of using gardens as a successful therapeutic tool builds, increasing numbers of health, social/public housing and education providers are asking for gardens to be included within their setting.

New research challenges us to see that design for health and well-being can occur across controlled and uncontrolled urban space. Citing international reports and case study examples, and showcasing different cultural and climatic conditions, we examine the broad potential of a salutogenic design approach. 'Healing gardens', as

the landscape type offering most healing properties, is the umbrella term we will use to describe any garden designed specifically to improve, maintain and enhance the well-being of people and the planet. We will use the term to describe both sensory and therapeutic gardens, as they are specifically designed to restore a community and an individual to health.

Architects, developers, and urban and landscape planners have an opportunity to incorporate healing landscapes into design schemes. Adopting a salutogenic[2] design perspective allows us to consider landscape architecture and design as a valuable tool to boost and maintain human health and well-being, reducing the need for costly social, educational, health and economic interventions.

We talk about resilience and resilient communities today in the way we talked about sustainability yesterday. Here we take resilience to mean 'the capability to anticipate risk, limit impact, and bounce back rapidly through survival, adaptability, evolution, and growth in the face of turbulent change'.[3] We are faced with climate change on a global level, with impacts being felt through extreme weather events locally on every continent. There have been devastating earthquakes, civil unrest and war. In September 2012 the rapid increase in non-communicable diseases was noted for the first time by the WHO as being 'of concern'. Any efforts to promote human well-being must be based on an understanding of the dynamic interplay among diverse environmental and personal factors, rather than on analyses that focus exclusively on environmental, biological or behavioural factors (Stokols, 1992).

Healing gardens and the wider landscape have much to contribute. The USA, followed by Mexico, Australia, New Zealand, the UK, Canada, Ireland, Chile, Iceland and Hungary, are the top ten countries facing an epidemic of obesity and a lack of physical fitness (*IBT*, 2013) . Inactive lifestyles could, according to recent estimates, cause the American adult obesity rate to reach 43 per cent by 2018. This would cost an additional US$344 billion in healthcare expenses related to diabetes and hypertension, among other diseases, in the USA alone. But inactive lifestyles are not just a problem for adults. Obesity threatens to shorten the lifespan of today's children by as much as five years; the first time in two centuries that a generation of children faces a shorter life expectancy than its parents. This issue, along with the significant role it plays in the overall escalating healthcare crisis, could cripple our economies, damage our communities, overstress our businesses and threaten the health security of future generations.

Over a decade of research now clearly links obesity, physical activity and the environment (Allison, 2013). But how, specifically, do we design communities and landscapes to positively and measurably influence physical well-being, health and productivity?

Healing gardens have been recognised as a useful part of the landscape since early walled Islamic gardens and monastic cloister gardens. However, not since medieval times have landscape and urban designers been considered or consulted for the public health potential of using sustainable sensory landscapes and sensitive built environments as early intervention, treatment and prevention strategies. In our quest for cost-engineered, pathogen-free environments we have largely forgotten our ability to use nature for its natural healing properties.

The market for the application of landscape interventions for health and well-being is large, and growing. Our population is ageing and health naturally deteriorates with age. Around the world healthcare and aged care costs are increasing at alarming rates. Costs of education have also gone up as students require more support to achieve learning outcomes. Infrastructure costs to mitigate the effects of climate change are rising with each major flood, storm and drought event. Taken together or even singly, these are burgeoning costs that cannot be met by society.

Through the development of healing, sensory and therapeutic gardens overlaid across the urban plan, incorporated within new social housing and built into public open space, we can ensure developments improve human health and that of the planet, are more efficient, cost effective, functional and ultimately sustainable. We can raise educational aspiration and achievement and reduce crime. If it sounds like we are presenting gardens as a universal panacea, to a certain extent we are. However (there is always a disclaimer), healing garden designers and their promoters need to be mindful of what they are trying to achieve, for without a deep understanding of the complex relationship between people and the land we simply get another ineffectual bed of lavender, three betula and a stamp of 'job done'. Once we understand *why* we need to provide nature connections we can explore where and how to maximise the effect of outputs, while minimising costs to society, within a sustainable ecological framework.

> Local and central governments need to be adaptable and creative in their response to proactive urban design for healthy lifestyles. Appropriate landscape and urban design can be used to prevent and diminish the severity of non-communicable diseases in indigenous, at-risk and non-indigenous populations.

For all the advances in research, the progress has been largely client-led. It is time we, as landscape professionals, put landscape back on the planning and development agenda as the cost-effective tool it is in addressing a variety of social and environmental concerns. Design for health and well-being is nothing new. In our contemporary world, however, it is a new way of looking at the potential of green space, a new way of putting landscape back up the priority list.

In the following chapters we will see that design for health and well-being can be incorporated across any setting. Gardens and playable spaces for children, whether in schools, on street corners, within public parks, healthcare settings or around housing, can be cost-effective developments. The return on investment, or ROI, is marked. Schools, business owners and developers benefit, while the community gains. In shopping strips, footfall numbers increase, properties sell faster, the area becomes known and is marketed for its competitive advantage. For schools it is the same. They gain a healthy environment that boosts the results of their students, so they attract more funding and more students, while building a sustainable community. We can quantify the cost of development and know that if we

apply salutogenic design principles we can save the client time, money and heartache. We can improve the public health of the community and at the same time improve the health of the planet.

To achieve cost-effective community health we need to use integrated systems thinking. Rising levels of non-communicable disease and social pathologies erode economies and communities, putting pressure on limited health and welfare resources. We have a solution. Positive links to the environment have been demonstrated in the literature, showing that absenteeism, binge drinking, some cancers, depression, heart disease, inequality, low aspiration, poor parenting and type 2 diabetes can all be influenced by the environment in which people live, work and play. Attracting and retaining a vibrant, healthy population within a changing multicultural community is influenced by the creation and maintenance of a sustainable, diverse ecology and built environment in and around our cities.

Historically, gardens performed a vital role. Garden designers were esteemed, educated people, and even in the early Middle Ages often widely travelled. They brought their knowledge and experience to bear in creative and often spiritually aware ways. Today we have become obsessed with profit margins, client face time, project turn-around times. It has become easy to think of gardens and green space purely in aesthetic terms. We intuitively know they look good and are necessary, but how often do we stop to ask ourselves *why* do we need them and what are they actually *for*?

We have an opportunity to make a fundamental difference to the fabric of society, cost-effectively building healthy, sustainable communities in the process. Social and therapeutic horticulture practitioners, occupational therapists, other healthcare professionals, special education teachers and community volunteers need to be able to reference and justify the development of gardens for health and well-being. *Landscape and Urban Design for Health and Well-Being* will guide you.

Notes

1 Public health promotion programmes are based on the prevention of mental and physical ill health. Because of the complexity of human health and well-being, effective salutogenic design is inherently a multi-disciplinary, multi-method approach.
2 The salutogenic approach aims to prevent illness, to maintain and enhance human health and well-being. Traditional healthcare takes a pathogenic approach, where various means are used to treat someone who is ill. It is generally accepted that it is less expensive to prevent illness than to treat it.
3 Resilience definition from www.resilientus.org/about-us/definition-of-community-resilience.html

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PART I

THE ORIGINS AND EVOLUTION OF HEALING GARDENS

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CHAPTER 1

The history

What were gardens for?

Gardens as havens, gardens for health

E. O. Wilson, father of the biophilia hypothesis, says our sense of belonging today comes from time in city parks, from choices we make for habitation, for where we spend our leisure time; time spent in gardens provokes deep memories of our evolutionary time on the African savannah. Wilson believes we are hard-wired to need nature around us, that it is within our genetic make-up that we are part of nature. Since he wrote *Biophilia* in 1984 and co-edited *The Biophilia Hypothesis* in 1993, around the world much research time and effort has gone into proving the case for our need to be surrounded by living things. This deep need is a core part of our being that when denied affects us in multiple ways.

> 'If there is an evolutionary basis for biophilia, then contact with nature is a basic human need: not a cultural amenity, not an individual preference, but a universal primary need. Just as we need healthy food and regular exercise to flourish, we need on-going connections with the natural world.'
>
> Judith Heerwagen, Ph.D.

As places to connect with nature within an urban framework, healing gardens are part of that universal primary need. The relationship between children's ability to learn, our social relations, our productivity at work, our propensity to commit crime and indulge in self-harming lifestyle behaviours, our appreciation and stewardship of the environment and our psychological and physical health, have all been studied in relation to time spent outdoors in nature. Wilson explains:

> All these things are intertwined, and so we have to learn how to look at them as one combined, nonlinear process that's just about going to bear us away unless we handle them now as a whole . . . And if we do it, there's going to be light at the end of that tunnel. We'll be so much better off.
>
> (Tyson, 2008)

Figure 1.1
Healing water garden, Surrey, UK.

Design for health and well-being requires us to focus first on where we have come from. In order to plan our way forward it is therefore helpful to look to the wisdom of the past. Indigenous peoples of North America, ancient wisdom from China, early philosophers and religious teachings from Europe and elsewhere, all look to the spiritual nature of the land, and its capacity to heal. When surrounded by the beauty, the power and the majesty of nature, our sense of awe and wonder is evoked. It is nature's capacity to inspire, to give peace, to heal, to balance life, that we value when we set out to create new landscapes.

Creating gardens and gardening (the tending of gardens and rearing of plants), along with animal husbandry, was one of our earliest forms of taming nature, bending it to our will. Early gardens were a simplification of Mother Nature herself, formed for the benefit of people but with few modifications of the natural form. Propagation of hybrids and elaborate training and cultivation techniques came later. Natural elements within the garden included flowers, shrubs and all-important trees. Trees were originally planted to provide shade, fruit and to uplift the soul through a view up through a tracery of leaves.

Today we talk about health spas being like 'an oasis in the city'. Early gardens often fitted the description of an oasis. The gardens were leafy, compact, welcoming spaces, developed around a water supply. Resources were scarce and from that scarcity came an understanding of and an appreciation for the need to work with nature, to grow what naturally grew in the local climate, that soil. The gardens were intimate spaces, at a scale easy to tend and comprehend. By being a smaller scale version of the wider landscape, early gardens were presented in a form able to be appreciated and understood by people regardless of age, ability or education.

Medieval gardens were about beauty and respite from the harsh world beyond the garden perimeter. Frequently walled to keep out wild animals or marauding

Figure 1.2 Date palms' tracery of leaves, Dubai.

Figure 1.3 Pergola perspective, Wisley Gardens, UK.

bandits, the gardens had an aesthetic that did more than just green and cool the space. Symmetry and line were balanced with a profusion of plants. The eye was eased down an axis, with resting points along the way.

Initially, using locally available materials, structures were built for the plants to grow over. As communities and economies began to expand, trading allowed for unusual and prized imported materials to be used within the gardens. These small buildings, arbours, pergolas and arches, were used to provide perspective, shade and frame views. In time some gardens evolved as a display of wealth. Most gardens, however, were necessarily low maintenance, as few people could afford the luxury of time to tend a purely decorative garden. They needed to grow plants and tend animals for food. Culinary herbs and vegetables were regularly mixed into herbaceous plantings. The mixed plantings enhanced the low maintenance aspect of the gardens by attracting beneficial insects and pollinators and reducing the risk of major outbreaks of pest infestation or disease. Interestingly that 'fashion' of mixing herbs and flowers, practicality with beauty, is becoming popular again today.

> Gardens, like most art forms, are heavily influenced by their moment in history. The level of cultural and spiritual enlightenment at the time in large part determines the style of garden.

Evidence in paintings and models provides information about our first gardens, such as we know them today, in Egypt. Early Egyptian gardens grew food and flowers,

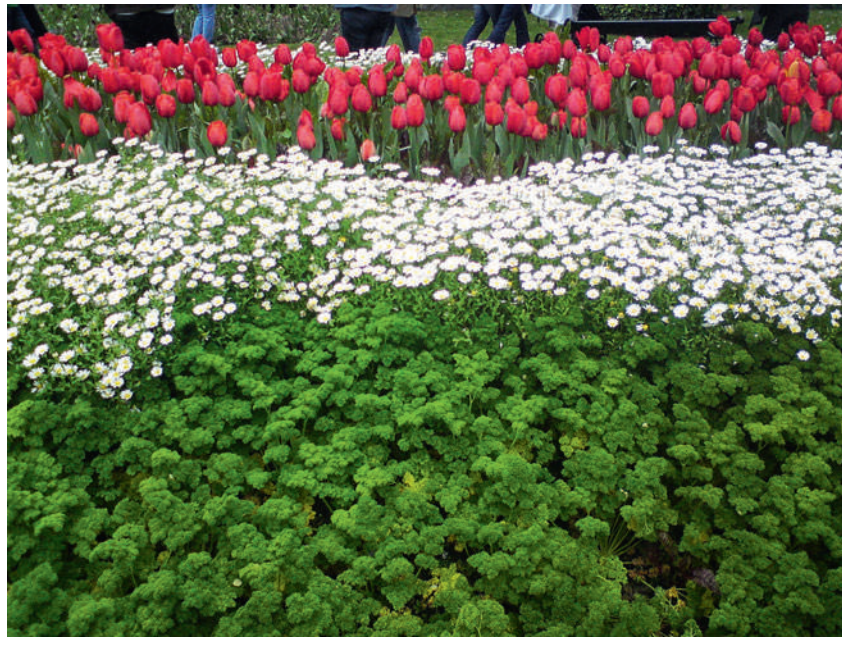

Figure 1.4 Wellington Botanical Gardens, New Zealand: Edible edging – parsley and tulips.

laid out as temple gardens and domestic gardens. Lilies and roses were also grown by the ancient Egyptians for perfume as an early form of commercial horticulture.

In China, Italy and Greece there is evidence of gardens 5,000 years ago. In China, however, the 'gardens' were more vast royal parks than intimate growing spaces. Smaller temple and domestic gardens came later.

As culture grew so did an appreciation of plants. We learnt how to grow them out of their natural habitat, and developed decorative containers to house them. Over time we placed symbolic sculpture and pots within natural plantings, developed tiled paths and terraces with intricate detailing in colours complementary to the plantings. While practical, the durable surface was also beautiful.

The gardens were relaxing havens, where people could go to 'take the air', walk, sit, pick and eat fruit, admire the colour, scents and sounds of nature.

History is rich with references to gardens and the people's close relationship to and with the affirming, sustaining, and health-giving properties of nature. Today though, how often do we forget the essence of a garden, that basic nature, that ability to heal, when we come to a design project? It has almost become the norm to allow ourselves to be driven by deadlines and budgets to the point where we forget what landscape and nature is about. We have become accustomed to seeing a design or a development scheme that looks good on paper but in reality takes its reference more from 'commercial realities' and the built environment than the natural environment to which we were originally so attracted.

Driven by desires for 'bigger, brighter, better', it is easy to forget *why* we are working on a project before contemplating what we are trying to achieve.

Figure 1.5 Tiled garden, Marrakech, Morocco.

Figure 1.6 Container grown plants, Marrakech, Morocco.

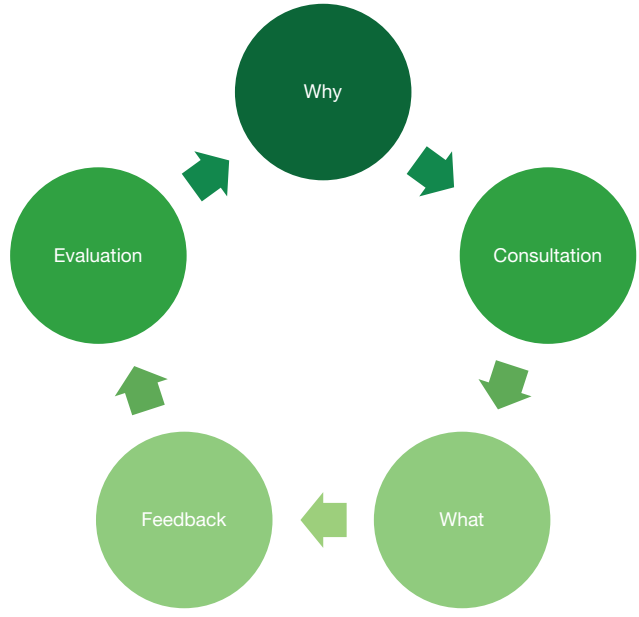

Figure 1.7 The design cycle.

Ancient to modern healing, sensory and therapeutic gardens

When looking to create healing gardens today, it is helpful to consider the healing gardens of yesterday. If we take two of the world's major religions as offering examples of early garden forms, as early as 1,500 years ago we see walled Islamic gardens and monastic cloister gardens being used as healing gardens. Designed and constructed to sustain the local community, the origin of today's model for salutogenic sustainable living can be traced to these gardens. Aiding health and well-being in a time of pestilence and strife, monastic and Islamic gardens shared many characteristics. Based on the belief in paradise on earth, the concept of a paradise garden is an ancient one, pre-dating the three great monotheistic religions, Judaism, Christianity and Islam, by centuries. These were early sensory gardens.

Paradise gardens

Islamic gardens referenced paradise through the Garden of Eden, with the 'river of life' flowing under the garden in irrigating, cooling rills. Fruit trees provided welcome shade as well as food. The fruit blossom provided fragrance, colour and general delight while also attracting beneficial birds, bees and insects. Gardens were laid indoors and out in a pleasing symmetrical fashion, where nothing jarred the eye but rather presented a balanced, calming view. They echoed the fundamental principle that this world is a reflection of a heavenly realm.

From early on in the Jewish and Christian traditions, 'paradise' became associated with the Garden of Eden. Prior even to that, the pre-Islamic Arabs considered the slightest indication of nature's greenness to be sacred. Since people were completely

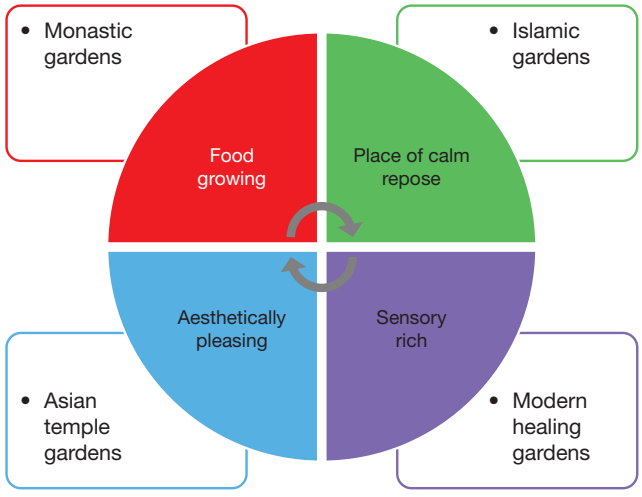

Figure 1.8 Historic religious gardens matrix.

Figure 1.9 Indoor water garden, Marrakech, Morocco.

dependent on the oases for their survival it was natural that they should love and revere nature's vegetation, both for its physical benefits and as a sign of the mysterious power that guided the universe.

This sense of mystery is an important element in garden design that we will come back to throughout the text. Gardens and nature have held and continue to hold a deep spiritual appeal, albeit sometimes on an unconscious level, for many people today. Although by nature humans are suspicious of things they cannot see or understand, we accept simple gardens and wider nature on a deep level, without need or desire to question. When we are in a garden, what bliss not to have to think